

International Conference on Manufacture of Lightweight Components –  
ManuLight2014

## Editorial

This Procedia CIRP volume includes the Proceedings of the 1<sup>st</sup> International Conference on Manufacture of Lightweight Components – ManuLight2014, sponsored by CIRP. The conference was organized by the Collaborative Research Center Transregio10 (Transregio10) and took place from 3-4 April 2014 in Dortmund, Germany. The Transregio10 has the aim to integrate forming, cutting, and joining for the flexible production of lightweight structures in a process chain and was initiated by the Institute of Forming Technology and Lightweight Construction (TU Dortmund University), the Institute of Machining Technology (TU Dortmund University), the Institute of Production Science (Karlsruhe Institute of Technology), the Applied Materials IAM–WK (Karlsruhe Institute of Technology), the Institute of Lightweight Structures (Technische Universität München), and the Institute for Machine Tools and Industrial Management (Technische Universität München) in 2003. The individual projects are coordinated by the spokesman Prof. A. Erman Tekkaya and the managing director Alessandro Selvaggio working at the Institute of Forming Technology and Lightweight Construction.

The research work in the present funding period focuses on the analysis of the whole process chain with regard to flexibility, quality, and integration as well as on the optimization of the single process and its embedding in the chain. For example, profiles with varying cross-section in longitudinal direction will be manufactured. These profiles allow a flexible design of frame structures according to given load tracks. A further aspect of higher flexibility is the embedding of functional elements into the profiles during the production process. These elements can also be used for energy and signal transport. By embedding such elements, the integration of special functions as well as the manufacture of a higher number of variants becomes possible.

In accordance with these research topics, ManuLight2014 was an event to present improvements of existing technologies as well as new processes, new equipment, and applications in order to stimulate a fruitful dialog between fundamental research and industrial applications and needs. The program covered all major areas in metal lightweight construction and also the challenges on manufacturing like

- forming, cutting, and joining of high strength and multi materials
- products with graded properties
- handling of lightweight components
- integration of functions
- sustainability and energy efficiency
- assembly and joining
- design for manufacturing
- machines and production systems

The main goal of the conference was to provide an international forum for the exchange of up-to-date knowledge, information, experiences, and results as well as for the review of progress and the discussion on the state of the art and future trends in metal lightweight construction and manufacturing. The event

offered an exciting opportunity for scientists and experts to meet, interact, and share ideas about this highly dynamic research field.

The Scientific Committee, consisting of 28 leading authorities from 12 countries, evaluated the submitted papers and thereby contributed to the quality of the conference. The response to the conference in terms of number of submitted papers and their quality level confirmed the worldwide interest in manufacturing technology and lightweight construction. A total of 44 papers were accepted for the conference and presented by authors from ten different countries and three continents. The presentations were grouped into eight main and eight parallel sessions assembled by the categories Joining, Forming, Cutting, Design, and Material. In addition to the accepted papers, two keynote lectures each from industry and academia were presented. The industrial keynote lectures were given by representatives of Volkswagen AG and Siemens AG. The academic keynote lectures were held by Prof. L. Fratini (University of Palermo) and by Prof. J. Hirsch (Hydro Aluminium Rolled Products GmbH).

Firstly, we want to acknowledge the German Research Foundation (DFG) for supporting the Transregio10. Also, we thank the members of the Scientific Committee for having devoted their time to review all papers and to making this event successful. The Organizing Committee members and the staff and graduate students are gratefully acknowledged for their energy and teamwork, the Session Chairmen for stimulating and managing the technical discussions, and all the authors for their high-level contributions and presentations in the plenary session. Finally, we thank all participants of the conference and all readers of this *Procedia CIRP* volume for their attention and interest, and hope that you find your interactions with this community to be an enriching experience.

Dortmund, July 2014

Prof. A. Erman Tekkaya  
Chairman and Editor